

Recent Advances in Science in Western Australia

Life Sciences

House mice have been shown by C R Dickman of the University of Sydney to respond to odours of their predators. Mice in areas with few endemic predators (cats, foxes, native cats) poorly discriminate between traps with and without faecal odours of the predators and do not prefer dense vegetation, whereas mice in areas with predators avoid traps with predator faecal odours and prefer dense vegetation. The survival rate for predator-experienced mice introduced to a study area containing cats and foxes is $2^{1/2}$ times higher than for predator-naive mice:

Dickman C R 1992 Predation and habitat shift in the house mouse, *Mus domesticus*. *Ecology* 73:313-322.

The standard metabolic rate of two species of varanid lizard has been shown by researchers from the University of Western Australia and Edith Cowan University to be proportional to body mass, rather than the more general relationship for animals of body mass^{0.75}. There was an exponential effect of ambient temperature on standard metabolic rate, and no plateau was observed for SMR between 30 and 40°C:

Thompson G G & Withers P C 1992 Effects of body mass and temperature on standard metabolic rates for two Australian varanid lizards (*Varanus gouldii* and *V. panoptes*). *Copeia* 1992:343-350.

Postmating mortality was thought to occur only in male *Antechinus* and *Phascogale* dasyurids, but C R Dickman of the University of Sydney and R W Braithwaite of the Division of Wildlife & Ecology, CSIRO Winnellie, report for the first time postmating mortality in field populations of the Dibbler (*Parantechinus apicalis*) and the native cat (*Dasyurus hallucatus*). The variation in life history strategies of dasyurids is more pronounced than had been suspected:

Dickman C R & Braithwaite R W 1992 Postmating mortality of males in the dasyurid marsupials, *Dasyurus* and *Parantechinus*. *Journal of Mammalogy* 73:143-147.

The honey possum is a small (7-15 g) nectar-feeding marsupial found only in south-western Australia. Although females have four teats, they rarely rear four young to independence. R D Wooller and K C Richardson of Murdoch University have demonstrated that most honey possums have a progressive reduction in the number of offspring as they grow in the pouch. This progressive brood reduction may optimise offspring production during the short lifetime of honey possums, in response to an unpredictable and specialised food supply:

Wooller R D & Richardson K C 1992 Reduction in the number of young during pouch life in a small marsupial. *Journal of Zoology, London* 226:445-454.

Researchers from the University of Western Australia have found a negative relationship between home range size and natural food abundance for a population of the southern brown bandicoot. However, home range area was found to increase with the provision of supplementary food. Bandicoots were not territorial, and the flexibility of their home range allows opportunistic exploitation of resources:

Broughton S K & Dickman C R 1992 The effect of supplementary food on home range of the southern brown bandicoot, *Isodon obesulus* (Marsupialia: Peramelidae). *Australian Journal of Ecology* 16:71-78.

Ritual combat has been reported between males of a variety of varanid lizards, but G G Thompson and P C Withers of the University of Western Australia and Edith Cowan University report for the first time male ritual combat for *Varanus caudolineatus* and *V. gouldii*. Behavioural variation in male ritual combat for these species is consistent with descriptions for other species in different *Varanus* lineages:

Thompson G G & Withers P C 1992 The combat ritual of two monitor lizards, *Varanus caudolineatus* and *Varanus gouldii*. *West. Aust. Naturalist* 19:21-25.

Earth Sciences

Landform and regolith stratigraphy for ten localities in Western Australia are used by D K Glassford and V Semeniuk to demonstrate that the Cainozoic cover predominantly consists of granitic saprolite unconformably overlain by allochthonous deposits which are mainly altered aeolian sands and sandy dusts. These descriptions challenge the traditional views of the autochthonous and colluvial origin of the Cainozoic cover of SW Australia:

Glassford DK & Semeniuk V 1991 Arid-zone landforms and Cainozoic regolith of the Yilgarn Block region of Western Australia. Excursion Guidebook, Joint Conference on Desert Landscapes and Past and Future Evolution of Deserts, International Geological Correlation Program Project 252. Bullcreek, Western Australia.

R W Young of the University of Wollongong provides an interesting contribution to geomorphological debate on the survival of features of great antiquity. The modern landscape of the East Kimberley bears the imprint of geological constraints (continental rifting, basin geometry and depositional style, variable diagenesis and relict weathering). The broad outline of the topography is interpreted as a Gondwanan relict, with only the final phase being post-Miocene:

Young R W 1992 Structural heritage and planation in the evolution of landforms in the East Kimberley. *Australian Journal of Earth Sciences* 39:141-151.

Researchers from the Geological Survey of Western Australia and Curtin University examine late Archaean plate tectonics using Rb-Sr, Sm-Nd and REE characteristics of granitic rocks. Granite-greenstones in the south-eastern Pilbara Craton are different from northern Pilbara granite-greenstones. A shear zone separating the Mosquito Creek Synclinorium from the Kurrana Batholith has characteristics of a suture zone, and is postulated to be the boundary between two distinct terrains that joined to form the Pilbara Craton between 3.0 and 2.76 Ga:

Tyler I M, Fletcher I R, de Laeter J R, Williams I R & Libby W G 1992 Isotope and rare earth element evidence for a late Archaean terrane boundary in the southeastern Pilbara Craton, Western Australia. *Precambrian Research* 54:211-229.

A comprehensive overview of the Darling Range as the world's leading bauxite producing region (16% of total world production) is provided by researchers from the Geological Survey of Western Australia. The lenticular

alumina-rich ore bodies, in the lateritic upland geomorphological division of the Darling Plateau, each contain 10 to 25 Mt, and the total economic bauxite resource is estimated at over 3500 M:

Hickman A H, Smurthwaite A J, Brown I M & Davy R C 1992 Bauxite mineralization in the Darling Range, Western Australia. Western Australia Geological Survey Report 33.

Note from the Hon Editor: This column helps to link the various disciplines and inform others of the broad spectrum of achievements of WA scientists (or others writing about WA). Contributions to "Recent Advances in Science in Western Australia" are welcome, and may include papers that have caught your attention or that you believe may interest other scientists in Western Australia and abroad. Papers in refereed journals, or books, chapters and

reviews will be accepted. Abstracts from conference proceedings will not be accepted. Please submit short (2-3 sentence) summaries of recent papers, together with a copy of the title, abstract and authors' names and addresses, to the Hon Editor or a member of the Publications Committee: Dr S D Hopper (Life Sciences), Dr A E Cockbain (Earth Sciences), and Assoc Prof J Webb (Physical Sciences). Final choice of articles is at the discretion of the Hon Editor.

"Letters to the Editor" concerning scientific issues of relevance to this journal are also published at the discretion of the Hon Editor. Please submit a word processing disk with letters and suggest potential reviewers or respondents to your letter.

P C Withers, Hon Editor, Journal of the Royal Society of WA.

Errata

Alphabetic letters with diacritical marks were inadvertently not printed in Volume 75 Part 3, but were replaced by a space. The correct authority names for species were:

Kyphosus sydneyanus Günther (page 67)

Lupinus digitalis Forskål (title page, pages 83-88)

The correct journal name for the reference, Tuschnjakowa (1935), on page 88 was:

Der Züchter